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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,956	05/24/2000	Anand Raghunathan	A7680	5487

7590 07/07/2004

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EXAMINER
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ROSSOSHEK, YELENA

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/576,956

Applicant(s)

RAGHUNATHAN ET AL.

Examiner

Helen B Rossoshek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because Figures 1, 6, 7, 9, 10, 14, 16, 17 have unreadable labels.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

The information of the Application on the Page 1 has to be updated.

Appropriate correction is required.

***Claim Objections***

3. Claims 3, 5, 7 are objected to because of the following informalities:

the limitation about perturbing an existing delay of the claim 3 is formulated not clear to what Applicant intent to mean ("by a value").

Claim 5 is formulated unclear to what Applicant intent to mean.

Claim 7 is formulated unclear to what Applicant intent to mean.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-9 are rejected under 35 U.S.C. 102(a) as being anticipated by Lahiri et al. ("Fast performance of bus-based system-on-chip communication architectures", IEEE/ACM International Conference).

With respect to claim 1 Lahiri et al. teaches receiving a partitioned system, communication architecture topology, input traces and performance matrices using tools POIS and PTOLEMY to partition (manually or automatically) into HW and SW and map this parts to pre-designed core (Pages 568, 569), wherein specifically the tool PTOLEMY provides performance estimation by simulation environment within the abstract model of communication between system components as a set of symbolic computation and communication traces for each component on the partitioned and

mapped system specification (Page 569); analyzing and creating communication analysis graph (CAG) using a data structure (bus and synchronization event graph) representing the traces as a graph (Page 569); partitioning communication instances to create partition clusters by generating the augmented BSE graph (clusters) which contain additional vertices and then splitting bus transfer vertices into smaller vertices (Page 569); evaluating cluster statistics related to the partition clusters and assigning parameter values to the partition clusters to form a new system with new communication architecture within the estimator which traverse and manipulate the BSE graph and computes a time-stamp for each vertex in the augmented BSE graph, wherein the time-stamps of the vertices generate various outputs (system with new communication architecture) (Page 569); reanalyzing the new system and recomputing performance metrics by using the results of performance estimation to modify the bus architecture (Page 569); if performance is improved then synthesizing CATs to realize optimized protocols can repeat the modification or stop if satisfaction has been reached since the process is iterative (Page 569); if performance is not improved then returning to step ( c ) within the ability to repeat the performance estimation and modification the bus architecture (Page 569).

With respect to claims 2-9 Lahiri et al. teaches analyzing the CAG to measure impact of individual communication instance delays on system performance by demonstrating the example 1 (Page 570) wherein wait times for accessing the bus of components  $C_1$  and  $C_2$  are measured depending on assigning level of priority for buss access; measuring performance impact of an instance using sensitivity by measuring

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the new wait time when bus parameters changed (Page 570); grouping instances having a similar impact on system performance into a same partition within the estimator when conflict (impact) is found, splits bus transfer vertices into smaller vertices and then traversing and manipulating the BSE graph, the estimator computes a time-stamp for each vertex in the clustered BSE graph (Page 569); perturbing an existing delay of the communication instance by a value within the estimator which computes bus-related statistics (Page 569); traversing a transition fanout of the communication instance in the CAG within the ability of traversing and manipulating to BSE graph (CAG) (Page 569); recomputing a start and finish time of affected vertices as shown on the Example 1 (Page 570); calculating changes in the system performance using recomputed finish time as described in the Case 3 wherein the bus time wait for component  $C_2$  was recalculated since the bus parameter have changed an higher priority for bus access for  $C_1$  has been assigned; step d is accomplished by deriving a metric that penalizes a partition having a negative impact on delays of communication events in other partitions as shown in the Case 2 of the Example 1 (Page 570) the wait time for component  $C_1$  was increased since component  $C_2$  has higher priority to access the bus; analyzing the CAG and evaluating for each partition pair  $CP_i$   $CP_j$  an amount of time for which communication events that belong to  $CP_i$  are delayed due to events from  $CP_j$  to form delay statistics within the ability of the system traversing and manipulating the BSE graph (CAG) to compute a time-stamp and changing the bus-related statistics such as amount of time each component spends waiting for the bus, handshaking with the arbiter, and waiting for synchronization events from other components (Page 569);

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combining the delay statistics into formula that produces an optimum parameter assignment as shown on the Fig. 8 wherein programming code demonstrates Example 1 including calculating delay statistics for Case 1 and Case 2 (Page 570); the parameter assignment is done using heuristics within the ability of the method working in the loop in the iterative manner, modifying the bus architecture and trying again until desired result is achieved (Page 569); the parameter is priority as demonstrated in the Example 1 (Page 570); the parameter is DMA block size (Page 569); the parameter assignment takes into account hardware complexity of implementing the parameter since DMA size is the parameter assigned to each component (of the hardware) (transmission of data in cluster or chunk) and there is relations between DMA size and priority of bus access (Page 568).

### ***Conclusion***

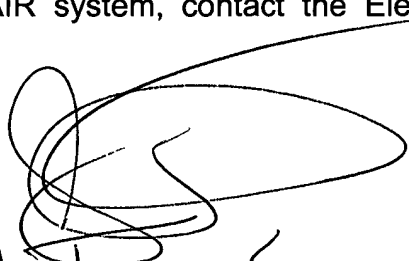
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen B Rossoshek whose telephone number is 571-272-1905. The examiner can normally be reached on 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HR



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